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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/810,735	03/25/2004	Jick M. Yu	42P6934D	9698

8791 7590 08/11/2006

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EXAMINER

MAI, ANH D

ART UNIT	PAPER NUMBER
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2814

DATE MAILED: 08/11/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

DETAILED ACTION

Status of the Claims

1. Amendment filed July 10, 2006 has been entered. Claims 31-54 have been cancelled. Claims 55-80 have been added. Claims 55-80 are pending.

Specification

2. The amendment filed July 10, 2006 is objected to under 35 U.S.C. 132(a) because it *introduces new matter* into the disclosure. 35 U.S.C. 132(a) states that no amendment shall introduce new matter into the disclosure of the invention. The added material which is not supported by the original disclosure is as follows: “**at least one annealing chamber**”.

Applicant is required to cancel the new matter in the reply to this Office Action.

The term “at least one” signifies more than one can be present. However, the original specification only indicated that **one and only one** annealing chamber is present.

Drawings

3. The drawings are objected to under 37 CFR 1.83(a). The drawings must show every feature of the invention specified in the claims. Therefore, the “metal deposition chamber to **deposit metal layers on wafers**” (claim 55, lines 2-3), must be shown or the feature(s) canceled from the claim(s). No new matter should be entered.

Corrected drawing sheets in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. The figure or figure number of an amended drawing

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should not be labeled as “amended.” If a drawing figure is to be canceled, the appropriate figure must be removed from the replacement sheet, and where necessary, the remaining figures must be renumbered and appropriate changes made to the brief description of the several views of the drawings for consistency. Additional replacement sheets may be necessary to show the renumbering of the remaining figures. Each drawing sheet submitted after the filing date of an application must be labeled in the top margin as either “Replacement Sheet” or “New Sheet” pursuant to 37 CFR 1.121(d). If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

Claim Objections

4. Claims 68, 69, 77 and 78 are objected to under 37 CFR 1.75(c), as being of improper dependent form for failing to further limit the subject matter of a previous claim. Applicant is required to cancel the claim(s), or amend the claim(s) to place the claim(s) in proper dependent form, or rewrite the claim(s) in independent form.

With respect to claims 69 and 78, since the transitional phrase “consists essentially of” have been determined to be the same as “comprising”, thus, the limitations of claims 69 and 78, reciting three components of the apparatus, have already been claimed in claims 67 and 76, respectively. Therefore, claims 69 and 78 fails to further limit claims 67 and 76, respectively.

With respect to claims 68 and 77, since the **function** of the robot is to move wafers from one chamber to another chamber, therefore by claiming the robot *to move* wafers from another

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chamber to one chamber does not further limit the functionality of the robot, thus fails to further limit the claims 67 or 76, respectively.

Claim Rejections - 35 USC § 112

The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

5. Claims 55-80 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention.

There does not appear to be a written description of the claim limitation “**at least one** annealing chamber” in the application as filed.

The original specification only support for **one** annealing chamber in the cluster tool.

Applicant must provide support for or cancel the new matter.

6. Claim 56 is further rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention.

There does not appear to be a written description of the claim limitation “the plurality of metal deposition chambers are chemical mechanical polishing chambers” in the application as filed.

It is well known that chemical mechanical polishing or CMP is for the removal of material not for depositing material as claimed.

Applicant must provide support for a CMP chamber that capable of depositing material.

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

7. Claims 55-80 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

The term “at least one annealing chamber” is indefinite because there is no upper limit to the amount of annealing chamber within the cluster tool.

With respect to claim 56, the claim is indefinite because the applicant appears to deposit material in an etching (CMP) apparatus.

8. Claims 57, 59, 60 and 66 recites the limitation "chemical vapor deposition chambers". There is insufficient antecedent basis for this limitation in the claim.

Neither claim 56 nor claim 55, in which claim 56 depend upon, recites chemical vapor deposition chambers.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

9. Claims 55-63, 65, 67-72, 74 and 76-80 are rejected under 35 U.S.C. 102(e) as being anticipated by Henley et al. (U.S. Patent No. 6,207,005) of record.

With respect to claim 55, insofar as the apparatus is concerned and as best understood by the examiner, Henley teaches a wafer processing **apparatus** as claimed including:

a plurality of metal deposition chambers, the metal deposition chambers to deposit metal layers on wafers; (col. 11, lines 20-29);

at least one annealing chambers (col. 10, line 65-col. 11, line 19), the at least one annealing chamber integrated with the wafer processing apparatus (10, 200, 300);

a robot (20) to move the wafers (col. 4, lines 18-21). (See Figs. 1-3).

Regarding the terms: “the metal deposition chambers to deposit metal layers on wafers”; “the at least one annealing chambers to anneal the metal layers to stabilize hardness of the metal layers prior to chemical mechanical polishing” and “robot to move the wafers having the metal layers deposited thereon from the chemical vapor deposition chambers directly to the one or

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more annealing chambers shortly after the metal layers have been deposited on the wafers”, these terms are considered to be **functionalities or utilities** of the components of a cluster tool.

Note that the claim is directed to **a wafer processing apparatus** not that of method of making or depositing metal on a wafer.

Since the apparatus of Henley comprises all components (metal deposition chamber, annealing chamber and robot) of the claim, thus the apparatus of Henley is **fully capable** of performing the functions or utilities as claimed, thus, the limitations of the claim are met.

Regarding the capability of the robot 20, since all the chambers of the cluster tool (10, 200, 300) are directly connected to the central wafer transfer chamber, therefore, the robot 20 is fully capable of transferring a wafer **directly** from one chamber to the other, prior to or shortly after a process has been completed depend upon the application.

With respect to claim 56, as best understood by the examiner, the plurality of metal deposition chambers are CVD or PVD chambers.

With respect to claim 57, the wafer processing apparatus of Henley consists essentially of CVD chambers, the at least one annealing chamber and the robot.

With respect to claim 58, the at least one annealing chambers of Henley is attached to the side of the wafer processing apparatus.

With respect to claim 59, as best understood by the examiner, the at least one annealing chamber is provide adjacent the wafer processing apparatus and its deposition chambers.

With respect to claim 60, as best understood by the examiner, the wafer processing apparatus of Henley includes a copper deposition chamber.

With respect to claims 61-63, the annealing chamber of Henley comprises a furnace, a heat lamp or a hot stage. (See col. 13, line 46-58).

With respect to claim 65, as best understood by the examiner, Henley teaches that the exact configuration of chambers used in the cluster tool depend upon the application, thus, the cluster tool of Henley can be used with or without a polishing chamber.

With respect to claim 67, insofar as the apparatus is concerned and as best understood by the examiner, Henley teaches a wafer processing apparatus as claimed including:

at least one annealing chambers (col. 10, line 65-col. 11, line 19), the at least one annealing chambers integrated with the wafer processing apparatus (10, 200, 300);

one or more chemical mechanical polishing (CMP) platforms (305), the one or more (CMP) platforms integrated with the wafer processing apparatus;

a robot (20) to move the wafers. (See Figs. 1-3).

Regarding the terms: “the at least one annealing chambers *to anneal* wafer having metal layers thereon to stabilize hardness of the metal layers prior to chemical mechanical polishing”; “the one or more chemical mechanical polishing platforms *to polish* the wafers including the metal layers” and “robot *to move* the wafers having the metal layers deposited thereon from the at least one annealing chamber directly to the one or more chemical mechanical polishing platforms”, these terms are considered to be the **functionalities or utilities** of each components of a cluster tool.

Since the apparatus of Henley comprises all components (annealing chamber, CMP platform and robot) of the claim, thus the apparatus of Henley is fully capable of performing the functions or utilities as claimed, thus, the limitations of the claim are met.

Regarding the capability of the robot 20, since all the chambers of the cluster tool (10, 200, 300) are directly connected to the central wafer transfer chamber, therefore, the robot 20 is fully capable of transferring a wafer directly from one chamber to the other, prior to or shortly after a process has been completed depend upon the application.

With respect to claim 68, as best understood by the examiner and as discussed above, the robot (20) of Henley is fully capable of moving the wafers from one chamber to another chamber depend upon the application.

With respect to claim 69, as best understood by the examiner, the wafer processing apparatus of Henley consists essentially of the at least one annealing chambers, the one or more chemical mechanical polishing platforms, and the robot.

With respect to claim 70, the at least one annealing chambers of Henley are attached to the side of the wafer processing apparatus.

With respect to claim 71, the at least one annealing chambers of Henley are provided adjacent to the wafer processing apparatus and one or more CMP platforms.

With respect to claim 72, the annealing chamber of Henley comprises one or more selected from a furnace, a heat lamp and a hot stage. (See col. 13, line 46-58).

With respect to claim 74, as best understood by the examiner, Henley teaches that the exact configuration of chambers used in the cluster tool depend upon the application, thus, the cluster tool of Henley can be used with or without a metal deposition chamber.

With respect to claim 76, insofar as the apparatus is concerned and as best understood by the examiner, Henley teaches a wafer processing apparatus as claimed including:

one or more chemical mechanical polishing (CMP) platforms (305), the one or more CMP platforms integrated with the wafer processing apparatus;

at least one annealing chambers (col. 10, line 65-col. 11, line 19), the one or more annealing chambers integrated with the wafer processing apparatus;

a robot (20) to move wafers. (See Figs. 1-3).

Regarding the terms: “the one or more chemical mechanical polishing platforms *to polish* the wafers having metal layers thereon”; “the one or more annealing chambers *to anneal* wafer having metal layers thereon to stabilize hardness of the metal layers after the wafers have been polished”; and “robot *to move* the wafers that have been polished from the one or more chemical mechanical polishing platforms directly to the one or more annealing chambers”, these terms are considered to be the functionalities or utilities of each components of the cluster tool.

Since the apparatus of Henley comprises all components (CMP platforms, annealing chamber and robot) of the claim, thus the apparatus of Henley is fully capable of performing the functions or utilities as claimed, thus, the limitations of the claim are met.

Regarding the capability of the robot 20, since all the chambers of the cluster tool (10, 200, 300) are directly connected to the central wafer transfer chamber, therefore, the robot 20 is fully capable of transferring a wafer directly from one chamber to the other, prior to or shortly after a process has been completed depend upon the application.

With respect to claim 77, as discussed above and as best understood by the examiner, the robot (20) of Henley is fully capable of moving the wafers from one chamber to another chamber depend upon the application.

With respect to claim 78, as best understood by the examiner, the wafer processing apparatus of Henley consists essentially of the at least one annealing chambers, the one or more CMP platforms and the robot.

With respect to claim 79, the at least one annealing chambers of Henley are attached to the side of the wafer processing apparatus.

With respect to claim 80, the one or more annealing chambers of Henley are provided adjacent to the wafer processing apparatus and one or more CMP platforms.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

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10. Claims 64, 66, 73 and 75 are rejected under 35 U.S.C. 103(a) as being unpatentable over Henley '005.

With respect to claims 64 and 73, Henley teaches (col. 13, lines 58-64) that the annealing chamber can heat the wafer to a temperature of about 450 °C or greater.

Note that, the limitation of the claims are the one or more annealing chamber are to heat to a temperature of about 200 °C.

The specification contains no disclosure of either the *critical nature of the claimed heat to a temperature of 200 °C* of any unexpected results arising therefrom. Where patentability is aid to based upon particular chosen dimension or upon another variable recited in a claim, the Applicant must show that the chosen dimension are critical. *In re Woodruff*, 919 F.2d 1575, 1578, 16 USPQ2d 1934, 1936 (Fed. Cir. 1990).

Therefore, it would have been obvious to one having ordinary skill in the art at the time of invention to was made to heat the wafer to the temperature (as claimed) depend upon the application since the annealing chamber of Henley is fully capable of heating to 450 °C or greater.

With respect to claim 66 and 75, as best understood by the examiner, Henley teaches the wafer processing apparatus as described in claims 56 and 67 above including a plurality of CVD chambers.

Thus, Henley is shown to teach all the features of the claim with the exception of explicitly disclosing a wafer processing apparatus comprises three CVD chambers.

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However, Henley further teaches it is possible to use any number of chambers if desired. (See col. 5, 38-44).

Therefore, it would have been obvious to one having ordinary skill in the art at the time of invention was made to include three CVD chamber in the wafer processing apparatus of Henley since Henley already recognize that any number of chambers can be used for the wafer processing apparatus. Furthermore, it has been held that mere duplication of the essential working parts of a device involves only routine skill in the art. *St. Regis Paper Co. v Bemis Co.*, 193 USPQ 8.

Response to Arguments

11. Applicant's arguments filed February 17, 2006 have been fully considered but they are not persuasive.

Applicant appears to argue about the functional limitation.

It has been settled that in a claim to apparatus, if the reference teaches all physical limitation, e.g., deposition chambers, annealing chamber and robot. Then the function of these elements are inherent functionality which the element are fully capable of performing.

Applicant's argument can not be taken place of an evidence. Applicant must provide evidence to support his contention that the wafer processing apparatus of Henley is not capable of the functions as claimed.

Conclusion

12. Although the same reference is applied, however, all claims are newly submitted, therefore, the rejections are considered to be new ground of rejection based upon the new claims.

13. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

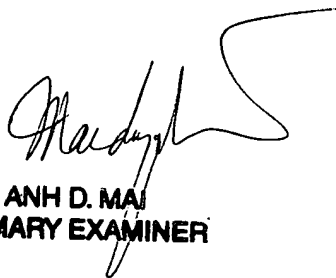
Any inquiry concerning this communication or earlier communications from the examiner should be directed to Anh D. Mai whose telephone number is (571) 272-1710. The examiner can normally be reached on 8:00AM-5:00PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Wael Fahmy can be reached on (571) 272-1705. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications

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may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



ANH D. MAI
PRIMARY EXAMINER